

### ***Remarks***

Reconsideration of remaining claims 1-11, 13-18 and 20-23 3 is respectfully requested.

In the Office action dated February 27, 2006, the Examiner objected to selected ones of the drawing sheets and claims, and issued a rejection of claims 1-15, 18, 19 and 23. Remaining claims 16, 17 and 20-22 were objected to as containing “patentable subject matter”, but depending from a rejected base claim. The Examiner’s various objections and rejections will be discussed below in the order appearing in the Office action.

### ***Drawing Objections***

The Examiner first objected to the drawings in that FIGs. 1, 2 and 7 needed to carry the designation “Prior art” (or a similar type of legend). FIG. 3 was further objected to by the Examiner inasmuch as the reference character “42” was used to designate both a pair of lenses and a beamsplitter arm. With respect to the Examiner’s comments regarding a second spectrometer and polarizer, the claims associated with this objection have been cancelled.

A set of corrected drawings (including the heading as “Replacement Sheet”) is included with this response to include the requested “Prior Art” legend and re-numbering of certain elements of FIG. 3. Applicants believe that with these corrections the drawings are now in proper form and respectfully request the Examiner to review the drawings and that the various objections have indeed been overcome.

### ***Claim Objections***

#### **Intended Use**

The Examiner first objected to claims 16 and 20-22 in that the preamble of each of these claims defines its “intended use”, and as the preamble is not given any patentable weight. In response, applicants have amended claims 16 and 20-22 in the manner shown

above to include the patentable subject matter within the body of each claim. It is believed that the cited claims are now in proper form and are in condition for allowance.

#### Formatting

Claims 1 and 20 were objected to regarding informalities in formatting, such as the inclusion of transitional phrases. Applicants have amended claims 1 and 20 in the manner shown above to address these issues and it is believed that claims 1 and 20 are now in proper form.

#### Antecedent Basis

Claims 1, 3, 12, 14, 16, 19 and 22 were cited by the Examiner as lacking the proper antecedent bases for various terms. As with the other claim objections, applicants have amended the cited claims (and have cancelled claims 12 and 19) to overcome the Examiner's objections. Applicants believe that all claims are now in condition for allowance over the Examiner's objections.

#### ***35 USC § 103(a) Rejection - Claims 1, 5, 9, 11 and 12***

The Examiner first rejected the above-cited claims under 35 USC 103(a) as being unpatentable over US Patent 5,633,712 (Venkatesh et al.) in view of German Patent DE 102-07-186.1 (Knuttel). The Examiner cited Venkatesh et al. as disclosing an arrangement utilizing a broadband light source and an optical spectrum analyzer to determine, for example, the thickness of an optical film

In response, applicants assert that Venkatesh et al. requires the utilization of an arrangement with at least one reflector disposed contiguous with the object being measured in to order to calculate the thickness values. As illustrated in FIG. 1 of Venkatesh et al., reference reflectors 25 and 26 are utilized as part of the arrangement to determine the thickness of film 15. The Examiner is further referred to Venkatesh et al. at column 5, beginning at line 5, where it states: "the reference reflector also provides a means for simplifying the interpretation of the output of the receiver. The simplification of the autocorrelator output from receiver 18 requires only one reference reflector. Either of the reflectors 25 and 26 shown in FIG. 1 will function for this purpose."

In contrast, no “reflector” is disclosed,, suggested or required in the arrangement of the present invention as defined by independent claim 1, or claims 5, 9 and 11 which depend therefrom (claim 12 having been cancelled).

The Knuttel reference was cited by the Examiner as disclosing a lensing arrangement for “first collimating and then focusing” an optical test signal. Regardless of the teaching of Knuttel, applicants assert that the combination of Venkatesh et al. and Knuttel still requires the use of at least one reflector (and preferably a pair of reflectors) within the arrangement to perform the measurements. Such is not the case with the arrangement of the present invention.

In light of this difference, applicants assert that independent claim 1, as well as remaining dependent claims 5, 9 and 11, are patentable over the cited combination of Venkatesh et al. and Knuttel. Applicants respectfully request the Examiner to reconsider this rejection and find claims 1, 5, 9 and 11 to be in condition for allowance.

### ***35 USC § 103(a) Rejection - Claim 2***

The Examiner next rejected claim 2 under 35 USC 103(a) as being unpatentable over the above-cited combination of references in further view of an article by Massig et al. appearing in *Applied Optics*. The Massig et al. article was cited by the Examiner as teaching the “filtering [of] FFT signals to solve the problem of inaccuracies in the spectrum due to spectral leakage”. The cited Massig et al. reference discusses the utilization of a frequency filter with the generation of a Fourier transform to reduce the sidebands associated with the periodic nature of the signal being subjected to transformation (see, for example, FIG. 1(b) of Massig et al. which illustrates sidebands surrounding peaks C and C<sup>\*</sup>). There is no discussion in Massig et al. regarding the use of a filter with a Fourier transform to discern signal peaks that are thereafter subjected to an inverse Fourier transform to form a cosine function indicative of the physical difference between layers in a multilayer optically transparent object. The inverse Fourier transform is mentioned in Massig et al. in terms of providing an improved filter function.

There is no discussion or disclosure in Massig et al. regarding the utilization of an inverse Fourier transform to recover information regarding the “inteference between two adjacent layers within the optically transparent object”, as defined in claim 2.

Given this difference, as well as the lack of teaching in the above-cited references regarding an arrangement without reflectors, applicants assert that claim 2 remains patentable over Massig et al. in combination with the Venkatesh et al. and Knuttel references.

***35 USC § 103(a) Rejection - Claims 3 and 4***

Claims 3 and 4 were next rejected by the Examiner under 35 USC 103(a) as being unpatentable over Venkatesh et al. and Knuttel (as applied to claim 1), in further view of US Patent 6,961,123 (Wang et al.). Regardless of the teaching of Wang et al., applicants assert that the combination of Venkatesh et al. and Knuttel lacks any teaching of an FDOCT arrangement that requires only a broadband lightwave source, optical beam splitter, lensing arrangement and optical spectrometer to determine predetermined characteristics (such as thickness) of various layers within an optically transparent element. Without this teaching, applicants assert that the cited references cannot be found to render obvious the subject matter of claims 3 and 4.

Applicants thus respectfully request the Examiner to reconsider this rejection and find claims 3 and 4 to be in condition for allowance.

***35 USC § 103(a) Rejection - Claims 6-8***

The Examiner next rejected claims 6-8 under 35 USC 103(a) as being unpatentable over Venkatesh et al. and Knuttel (as above), in further view of an article by Nishimura et al. appearing in *IEEE Journal of Selected Topics in Quantum Electronics*. Regardless of the teaching of Nishimura et al., applicants again assert that the above-discussed combination of Venkatesh et al. and Knuttel lacks any teaching of an FDOCT arrangement that requires only a broadband lightwave source, optical beam splitter, lensing arrangement and optical spectrometer to determine predetermined characteristics (such as thickness) of various layers within an optically transparent element. Without this teaching, applicants assert that the cited references cannot be found to render obvious the subject matter of claims 6-8.

Applicants thus respectfully request the Examiner to reconsider this rejection and find claims 6-8 to be in condition for allowance.

***35 USC § 103(a) Rejection - Claim 10***

Claim 10 was next rejected by the Examiner under 35 USC 103(a) as being unpatentable over the combination of references cited above in association with claims 6-8, in further view of an article by Jauncey et al. appearing in *Optics Letters*. Regardless of the teaching of Jauncey et al., applicants again assert that the above-discussed combination of Venkatesh et al. and Knuttel lacks any teaching of an FDOCT arrangement that requires only a broadband lightwave source, optical beam splitter, lensing arrangement and optical spectrometer to determine predetermined characteristics (such as thickness) of various layers within an optically transparent element. Without this teaching, applicants assert that the cited references cannot be found to render obvious the subject matter of claim 10.

Applicants thus respectfully request the Examiner to reconsider this rejection and find claim 10 to be in condition for allowance.

***35 USC § 103(a) Rejection - Claim 13***

The Examiner next rejected claim 13 under 35 USC 103(a) as being unpatentable over Venkatesh et al. and Knuttel (as applied to claim 1), in further view of US Patent 6,661,502 (Jakobsen et al.). Regardless of the teaching of Jakobsen et al., applicants again assert that the combination of Venkatesh et al. and Knuttel lacks any teaching of an FDOCT arrangement that requires only a broadband lightwave source, optical beam splitter, lensing arrangement and optical spectrometer to determine predetermined characteristics (such as thickness) of various layers within an optically transparent element. Without this teaching, applicants assert that the cited references cannot be found to render obvious the subject matter of claim 13.

Applicants thus respectfully request the Examiner to reconsider this rejection and find claim 13 to be in condition for allowance.

***35 USC § 103(a) Rejection - Claims 14, 19 and 23***

Claims 14, 19 and 23 were next rejected by the Examiner under 35 USC 103(a) as being unpatentable over Venkatesh et al. in view of Jakobsen et al. Claim 19 has been

cancelled from this application. With respect to independent 14 and associated dependent claim 23, applicants assert that the combination of Venkatesh et al. and Jakobsen et al. is limited to teaching a method of measuring the thickness of various layers within an optical fiber that requires at least one reflective surface (25, 26) to be disposed adjacent to the fiber being tested. The method of the present invention as defined by independent claim 14 requires no such reflective surface to be used.

Applicants thus respectfully request the Examiner to reconsider this rejection and find independent claim 14, as well as dependent claim 23 to be in condition for allowance.

***35 USC § 103(a) Rejection - Claims 15 and 18***

Claims 15 and 18 were next rejected by the Examiner under 35 USC 103(a) as being unpatentable over Venkatesh et al. and Jakobsen et al. in view of Massig et al. For the reasons stated above in association with the rejection of independent claim 14, applicants assert that the combination of Venkatesh et al. and Jakobsen et al. with Massig et al. still lacks any teaching of a method for determining the thickness of various optical fiber layers that does not require a reflective surface. Applicants thus respectfully request the Examiner to reconsider this rejection and find claims 15 and 18 to be in condition for allowance.

***Allowable Subject Matter***

The Examiner has cited claims 16, 17 and 20-22 as containing patentable subject matter. Applicants affirm this statement and believe that these claims, in their current dependent form, remain in condition for allowance.

In summary, applicants have amended various ones of the claims in order to overcome the Examiner's objections and rejections. Applicants believe that the case, in its present form, is now in condition for allowance and respectfully request an early and favorable response from the Examiner in that regard. If for some reason the Examiner does not agree that the case is ready to issue and that an interview or telephone

conversation would further the prosecution, the Examiner is invited to contact applicant's attorney at the telephone number listed below.

Respectfully submitted,

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